American Peregrine Falcon

(*Falco peregrinus*)

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Status

Federal: Delisted in 1999

State: Endangered; Fully Protected

Other: G4 T3 S2; California Department of Forestry Sensitive; U.S. Forest Service Sensitive; USFWS Bird of Conservation Concern; Federal Migratory Bird Treaty Act

Recovery Plan: *The Pacific Coast American Peregrine Falcon Recovery Plan* (USFWS 1982). Recovery resulted in delisting.

Monitoring Plan: Monitoring Plan for the American Peregrine Falcon, A Species Recovered Under the Endangered Species Act (U.S. Fish and Wildlife Service 2003).

Placer Legacy Category: Class 1

Distribution

North America

Peregrine falcon is found on all continents but Antarctica. American peregrine falcon occurs in North America from south of the tundra to northern Mexico and migrates to Central America (Ferguson-Lees and Christie 2001).

California

Historically, American peregrine falcon occurred throughout most of California (California Department of Fish and Game 1980; USFWS 1982). The California breeding range has been expanding and now includes the central and southern California coast, inland northern Coast Ranges, Klamath Mountains, Cascade Ranges, and Sierra Nevada (California Department of Fish and Game 2000). Although relatively uncommon, wintering birds can be seen throughout California (Zeiner et al. 1990). Populations increase in winter with the arrival of migrating birds from the north (Grinnell and Miller 1944). Historically, American peregrine falcon nested throughout the state, with concentrations along the coast and around the Channel Islands (Grinnell and Miller 1944).

Placer County Plan Area

Historical

There are no historical records of American peregrine falcon nesting in Placer County, although the species is found in low numbers throughout the county in all seasons (Webb 2009).

Current

The California Natural Diversity Database lists no records of American peregrine falcon nesting in western Placer County. However, a pair has nested since 2007 at a site along the north fork

of the American River near Alta (D. Ross, pers. comm.). There is also a known breeding site in Yuba County approximately 30 miles from the boundary of the Plan area (T. Beedy pers. comm.).

Population Status & Trends

North America

American peregrine falcon declined after the 1940s as a result of the widespread use of chlorinated hydrocarbon pesticides (U.S. Fish and Wildlife Service 1982). Bans on the use of DDT in the 1970s and a major reintroduction program led by the Peregrine Fund have resulted in an impressive increase in the distribution and abundance of this species over the last 20 years. The population increase has been substantial enough to warrant the taxon's delisting, in August 1999, from the federal endangered species list (Mesta et al. 1995; Cade et al. 1997), although this decision is controversial (Pagel et al. 1996; Pagel and Bell 1997).

California

The American peregrine falcon population in California began to decline seriously in the 1950s. From a conservative historical estimate of 100 pairs breeding in California before 1947, fewer than 10 nesting sites were believed active in 1969 (Herman et al. 1970). Since 1970, additional nesting pairs have been located. This increase in numbers is probably due to the effects of more exhaustive search efforts in conjunction with an intensive captive breeding and nest augmentation program (White et al. 2002). Although monitoring efforts have been reduced, and no comprehensive surveys have been conducted since 1992, current data indicate the population has continued to increase (California Department of Game and Fish 2000). The 1992 survey documented 113 pairs in California. The most recent statewide survey in 2006, coordinated by the Santa Cruz Predatory Birds Research Group, documented 154 nest sites with active pairs. These are minimum estimates, since nest sites are often in remote areas that are difficult to access (Santa Cruz Predatory Bird Research Group 2009).

Placer County Plan Area

Peregrine falcon occurs regularly but in small numbers throughout the year in Placer County (Webb 2009). There is no information on population trends that is specific to the Plan area.

Natural History

The habitat requirements, ecological relationships, life history, and threats to American peregrine falcon described below are summarized in diagram form in the envirogram (Figure 1).

Habitat Requirements

American peregrine falcon nests almost exclusively on protected ledges of high cliffs, primarily in woodland, forest, and coastal habitats (California Department of Fish and Game 1980; U.S. Fish and Wildlife Service 1982; White et al. 2002). A very small number of nests have been found on small outcrops and in trees, and a number of reintroduced pairs nest on tall buildings and bridges. Cliffs that provide ledges, potholes, or small caves (usually with an overhang), and that are relatively inaccessible to mammalian predators, are required components of nesting habitat. Most American peregrine falcon cliff nest sites are on nearly vertical cliffs 160-660 feet high (White et al. 2002). Nest sites usually provide a panoramic view of open country, are near water, and are associated with a local abundance of passerine, waterfowl, or shorebird prey (Johnsgard 1990; White et al. 2002). American peregrine falcon has been known to nest at elevations as high as 10,000 feet, but most occupied nest sites are below 4,000 feet (Shimamoto and Airola 1981; White et al. 2002). American peregrine falcon prefers to nest near

marshes, lakes, and rivers that support an abundance of birds (Grinnell and Miller 1944; California Department of Fish and Game 1980), but travels several miles from nest sites to forage on pigeons, shorebirds, waterfowl, and songbirds (White et al. 2002). Coastal and inland marsh habitats are especially important to American peregrine falcon in fall and winter due to large concentrations of waterbirds (California Department of Fish and Game 1980). American peregrine falcon overwinters in western Placer County. The species forages for waterfowl and other birds in flooded rice fields, fresh emergent wetlands, and vernal pool complexes (E. Pandolfino, pers. comm. 2009).

Reproduction

The breeding season of American peregrine falcon generally begins in February and lasts until June. Courtship (in February) typically involves the male provisioning the female with food. A month or two after courtship begins, females normally lay 3-5 eggs; egg-laying in California typically occurs in March. Both male and female incubate the eggs for 29-33 days. In California, fledging occurs in late May or early June when the young are 35-42 days old. Juvenile peregrine falcons become independent 6-15 weeks after fledging. If a nest fails early due to predation or other factors, the pair may lay a second clutch at an alternate nest site (California Department of Fish and Game 1989; Ferguson-Lees and Christie 2001; White et al. 2002).

Dispersal Patterns

In California, juvenile peregrine falcon range more widely than adults and can travel as far as Mexico and Oregon. Birds reach maturity at 2-3 years. Once a bird reaches maturity, it may replace a dead member of a breeding pair, acquire a mate and establish a new territory, or occupy and defend a potential territory prior to pairing. Though peregrine falcon occasionally establishes territories far (up to hundreds of miles) from the natal site, they more commonly establish territories in the general vicinity of the natal site (White et al. 2002). No peregrine falcons banded as juveniles in California have been found outside the state as adults (California Department of Fish and Game 1989).

Longevity

American peregrine falcon is relatively long-lived. The longevity record for a wild bird is at least 19 years 3 months (U.S. Geological Survey 2002). A few captive birds have lived beyond 20 years (White et al. 2002).

Sources of Mortality

Known predators of American peregrine falcon include great horned owl (*Bubo virginianus*), golden eagle (*Aquilla chrysaetos*), red-tailed hawk (*Buteo jamaicensis*), raccoon (*Procyon lotor*), and coyote (*Canis latrans*) (White et al. 2002). However, predation is not known to substantially affect American peregrine falcon population levels (U.S. Fish and Wildlife Service 1999).

Behavior

During the breeding season, adult American peregrine falcon attacks and chases other raptors away from the nest, especially golden eagles and other peregrine falcons that move through their territory. Adults hunt over a large area around the nest site; foraging may occur up to 12 miles from the nest (White et al. 2002).

American peregrine falcon feeds almost exclusively on birds; most of its avian prey is medium-sized to moderately large. It typically feeds on highly mobile, flocking, and colonial nesting birds, such as shorebirds, waterfowl, doves, and pigeons (Johnsgard 1990). American peregrine falcon chases and grabs prey or dives down on prey at speeds up to 200 miles per

hour (i.e., *stooping*). During the stoop, an American peregrine falcon grasps its prey or strikes it with its talons and subsequently retrieves it on the ground. American peregrine falcon hunts during the day or at dusk (White et al. 2002).

Movement and Migratory Patterns

During the fall and spring, the tundra subspecies (*F. p. tundrius*) and northern populations of American peregrine falcon migrate through California to and from breeding and wintering areas (White et al. 2002). In California, American peregrine falcon usually remains near breeding territories year-round, but during late summer and winter, they move relatively short distances to preferred foraging areas (California Department of Fish and Game 1989).

Ecological Relationships

American peregrine falcon competes with other raptors such as golden eagle, red-tailed hawk, and prairie falcon (*Falco mexicanus*) for cliff-nest sites (U.S. Fish and Wildlife Service 1982; White et al. 2002). There is concern that American peregrine falcon may depredate other endangered species of birds, such as marbled murrelet (*Brachyramphus marmoratus*) and California least tern (*Sterna antillarum browni*) (California Department of Fish and Game 2000).

Population Threats

The widespread use of organochlorine pesticides, especially DDT, was a primary cause of the decline in American peregrine falcon populations (U.S. Fish and Wildlife Service 1982; White et al. 2002). High levels of these pesticides and their metabolites (i.e., byproducts of organic decompositions) have been found in the tissues of American peregrine falcon, leading to thin eggshells and reproductive failure. Other causes of decline include illegal shooting, illegal falconry activities, and habitat destruction and modification (California Department of Fish and Game 1980; White et al. 2002).

Context for a Regional Conservation Strategy

American peregrine falcon occurs regularly but in small numbers throughout the year in Placer County. Documented habitat use includes foraging over areas with high prey species abundance, such as marshes and agricultural lands (e.g., flooded rice fields). Although nesting sites have not been documented in Placer County, the species' presence year-round and the documentation of a breeding site in Yuba County, 30 miles from the Plan area, suggest that there is potential for American peregrine falcon to nest in Placer County, given suitable breeding habitat. Suitable breeding habitat includes sheer cliffs along the Coon Creek and American River corridors. A map of the species' California Natural Diversity Database records in California is not provided as the California Natural Diversity Database only lists 14 occurrences, for which the location information is suppressed. Wintering birds are found throughout California, but are uncommon. Breeding sites are known to be rare in the region, and therefore protection of potential breeding habitat in the plan area is of high priority. In addition, the preservation or acquisition of foraging habitat is critical for American peregrine falcon conservation in the Plan area.

Modeled Species Distribution in the Plan Area

Model Assumptions

<u>Nesting Habitat (Primary Habitat)</u>

Modeled nesting habitat is characterized by barren rock land-cover type, which occurs primarily along the American River.

Overwintering Habitat (Secondary Habitat)
Modeled overwinter habitat includes foraging and movement habitat. Modeled foraging habitat is defined as vernal pool complex, fresh emergent wetland, seasonal wetland, irrigated pasture, and rice. American peregrine falcon movement habitat includes vernal pool complex, annual grassland, and pasture land-cover types.

Rationale

American peregrine falcons nest on ledges provided by cliffs and buildings. Cliff nest sites are nearly vertical and are between 160 – 660 feet high (White et al. 2002). The barren land-cover type was used to model potential breeding habitat, as this land-cover type includes rock outcrops and cliffs. Not all barren land-cover will include potentially suitable cliff habitat, however, so this is likely an overestimate of available breeding habitat in the Plan area. American peregrine falcon is not known to nest within the Plan area; however, a pair has nested since 2007 at site along the North Fork of the American River near Alta. There is also a known breeding site in Yuba County approximately 30 miles from the boundary of Plan area. Therefore, American peregrine falcon could potentially breed within the Plan area as the breeding population expands in California.

American peregrine falcons are found in the Plan area primarily as overwintering individuals. American peregrine falcons forage primarily for waterbirds and other birds in wetlands and flooded rice fields in the Plan area.

Model Results

Figure 2 shows the modeled potential habitat for American peregrine falcon within the Plan area. Potential nesting habitat is limited to the cliffs and barren rock along the North Fork American River on the eastern edge of the planning area. American peregrine falcons occur in the Plan area as overwintering individuals; overwintering habitat is distributed primarily in the eastern, Valley portion of the Plan area.

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Envirogram Narrative

American Peregrine Falcon (*Falco peregrinus*)

The envirogram was created based on the information provided in this species account. The envirogram is a tool to help depict and organize the most important ecological factors that affect a population or group of populations of a particular species. The envirogram consists of Direct Components – components of the environment that directly affect a species' chances to survive and reproduce, and several webs comprised of distal factors (i.e., Indirect Components, Management Problems, and Mitigation Actions) that act in sequence to affect the Direct Components. The Direct Components consist of four major categories: resources, hazards, reproduction, and dispersal. Each of these is subdivided as necessary. For example, resources are subdivided into food and foraging habitat. Hazards are divided into habitat loss, pesticide poisoning, shooting, and electrocution.

The webs identify the underlying ecological processes or human actions that influence each Direct Component. Distal factors in the web activate proximate components. Each of these pathways in the web are constructed from right to left, with Indirect Components immediately to the left of Direct Components directly affecting the Direct Component, and secondary Indirect Components affecting primary Indirect Components. Management Problems can directly affect the Indirect Components, and Mitigation Actions provide solutions to remedy the Management Problems.

<u>Resources</u>
Res1: American peregrine falcon are present in small numbers as non-breeders in the Plan area. Its preferred foraging habitat is anyplace with high densities of medium-sized to fairly large birds, particularly shorebirds and waterfowl. In the Plan area these localities are usually rice fields and fresh emergent wetlands. Burning rice stubble reduces the food supply for prey species, but flooding rice fields in winter promotes natural decomposition and provides food for waterfowl and shorebirds. Draining and filling of wetlands also eliminates foraging habitat for peregrine falcon; wetland restoration can help mitigate this loss. Weather also affects the availability of food for prey species.

<u>Hazards</u>
Haz1: Loss of foraging habitat through conversion of rice fields to orchards and vineyards and draining and filling of wetlands is a hazard for American peregrine falcon in Placer County. Agricultural easements may help remove some of the motivation for rice field conversion, and proper valuation and restoration of wetlands can help conserve that habitat.

Haz2: Pesticide poisoning, which caused eggshell thinning and subsequent breeding failure, was the major reason that American peregrine falcon was listed under the Endangered Species Act. Although the species has rebounded, birds still may pick up DDT on the wintering grounds in Mexico and residual DDT in offshore waters via the food chain. Enforcing the ban on these pesticides is important for the continued recovery of this species.

Haz3: Illegal shooting and the trapping of passage birds for falconry (also illegal) are potential threats to the peregrine in Placer County. Lack of education on the value of raptors in the wild and lax law enforcement can be overcome by education and more vigorous prosecution of offenders.

Haz4: American peregrine falcon is subject to electrocution resulting from improper design of electrical transmission towers, lines, and insulators. Better design of transmission lines and anti-perching devices can alleviate this problem to some extent.

Reproduction

Rep1: American peregrine falcon does not nest in Placer County at present. Breeding populations in California are found along the central and southern coast, the North Coast Ranges, Klamath Mountains, Cascades, and Sierra Nevada. The nesting success of individual pairs depends upon the physical condition of the birds, especially females, in the spring, and on the abundance of prey, weather conditions, and land and water management in the breeding grounds. Because the physical condition of the birds depends on overwintering conditions, Placer County can play a major role in reproductive success; conservation of wetlands and rice fields contribute to good winter habitat.

Migration

Mig1: Successful migration to the breeding area depends on the conditions and land use on the migratory route, the weather, and on the physical condition of the birds in the spring, which in turn depends on overwintering conditions and good winter habitat. Placer County can play a major role in successful migration by conserving wetlands and rice fields.

Summary

The best strategy for conserving the overwintering population of American peregrine falcon in Placer County is to ensure that areas that concentrate waterfowl and shorebirds, their major prey items, are conserved. These areas are rice fields and fresh emergent wetlands.

Peregrine falcon, *Falco peregrinus*

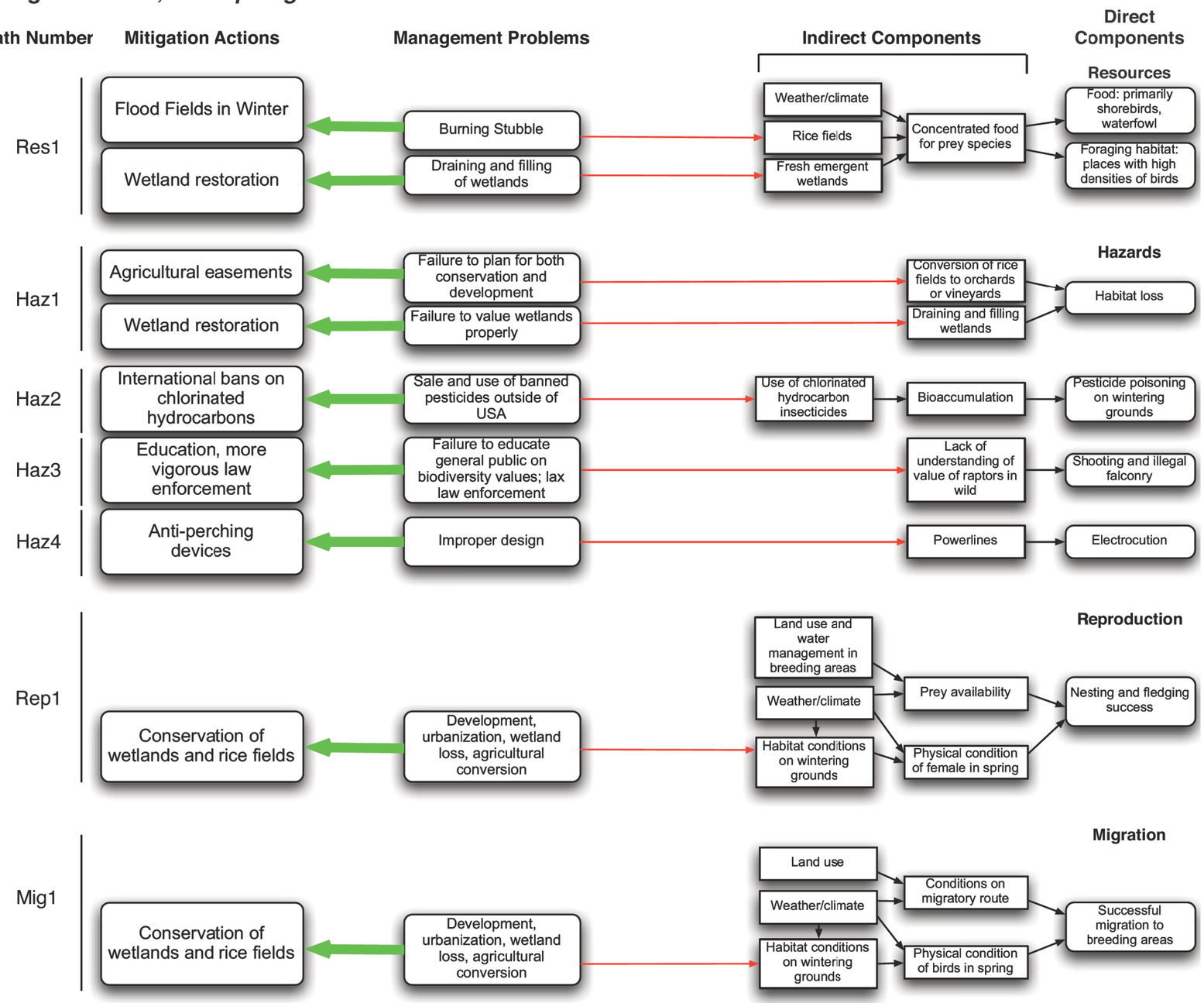

Figure 1. Envirogram. Res = Resources; Haz = Hazards; Rep = Reproduction; Mig = Migration.

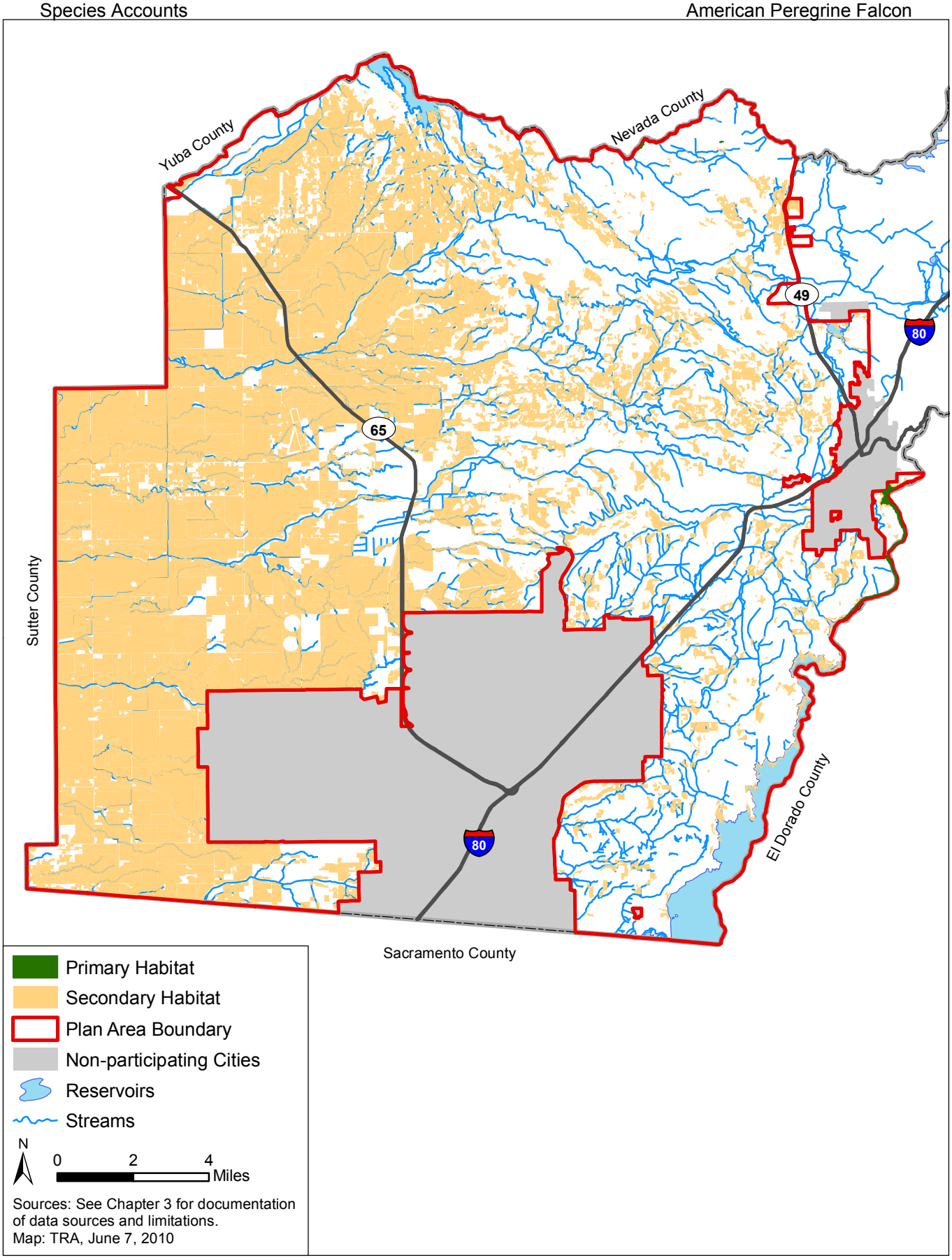

Figure 2. American peregrine falcon modeled habitat distribution. The habitat map present outcomes of the draft model described above. The purpose of the model is to identify areas within the Plan area where the species occurs or could occur based on known habitat requirements. Those data on which this map is based are regional in scale. This map should not be used for site planning and should be verified in the field.